DOCUMENT RESUME

ED 162 905 SE 025 444

AUTHOR Lent, Judith; And Others
TITLE America's Wild Horses "Fitting 'Em In": A Social Studies Subject for Upper Elementary Students. Teachers Guide.
INSTITUTION Bureau of Land Management (Dept. of Interior), Washington, D.C.
PUB DATE Jul 78
NOTE 42p.; Activity poster removed prior to being shipped to EDRS for filming

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Biological Sciences; Conservation Education; *Ecology; Elementary Secondary Education; Environment; *Environmental Education; *Horses; Instructional Materials; Land Use; *Natural Resources; Social Studies; Teaching Guides; *Wildlife Management
IDENTIFIERS *Burros

ABSTRACT

This learning package is designed to portray to upper elementary and junior high school students the various factors influencing the relationship of wild horses and burros to their environment in the Western United States. Protected by the Wild and Free-Roaming Horse and Burro Act of 1971, the thousands of protected horses and burros pose a challenge to government leaders, land managers, ranchers, and citizens as they consider methods for managing growing herds on public lands. Discussed are the role of wild horses and burros in Western history; their relationship to their ecosystem; the need for management; and management alternatives and land use decisions. The package includes a teacher's guide and activity poster. It is designed to be used with the film "Dapples and Grays, Pintos and Bays," and a children's story, "Thank You for Helping Us." (SE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED162905

AN ENVIRONMENTAL LEARNING PACKAGE

TEACHER'S GUIDE

SE 025 444

U.S. DEPARTMENT OF THE INTERIOR • Bureau of Land Management

AMERICA'S WILD HORSES
"FITTING 'EM IN . . ."

A Social Studies Subject for Upper Elementary Students

TEACHER'S GUIDE

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

July 1978

This environmental learning package has been developed by:

Judith Lent, Public Information Specialist, Eastern States Office;

Virginia Lewis, formerly Environmental Education Specialist, Montana State Office; and

Jack Sept, Visual Information Specialist, Montana State Office

Under the direction and guidance of:

Daniel Alfieri, Chief, Office of Public Affairs, Washington Office; and

Phil DeLongchamps, formerly Environmental Education Co-ordinator, Washington Office

Bureau of Land Management
U.S. Department of the Interior

CONTENTS

Page

INTRODUCTION i

DEAR TEACHER iii

LESSON 1: AWARENESS
History of Wild Horses and Environmental Terms

Teacher's Page 1
Some Basic Facts About Wild Horses & Burros 2
Vocabulary 4

LESSON 2: MANAGEMENT
Relating Animal Management to Wild Horses and Burros

Teacher's Page 7

LESSON 3: RELATIONSHIPS
Human Needs and Wild Horse & Burro Needs

Teacher's Page 9

LESSON 4: INVESTIGATION AND PROBLEM SOLVING
The Natural Environment and Land Use Decision-Making

"Exploring Ecosystems"—Outdoor Investigation
Teacher's Pages 11
Student Worksheets 14

"Wild Horses on Public Lands"—Simulation Game
Teacher's Pages 29
The Issue 31
Summary PL 92-195 32
Group Data Sheets 33

LESSON 5: WRAP-UP AND EVALUATION
Wild Horses and Burros—"Fitting 'em In..."

Teacher's Pages 37

SELECTED REFERENCES 39

INTRODUCTION

AMERICA'S WILD HORSES... and burros... provide a unique focal point for timely classroom participation in environmental studies.

Thousands of these animals are roaming free on America's western rangelands, and multiplying at startling rates due to the protection afforded by the Wild Free-Roaming Horse and Burro Act of 1971. By law, wild horses and burros are recognized as an integral part of our National heritage and the natural environment in which they live.

"FITTING 'EM IN..." is the challenge that now faces government leaders, land managers, ranchers, and citizens everywhere as they consider the methods for managing and protecting the growing herds, found mostly on public lands.

As part of its environmental awareness program, the Bureau of Land Management has designed this educational package to supplement traditional classroom education as a relevant learning guide to help students become more aware of their surroundings; identify and investigate problems; and seek effective solutions.

"FITTING 'EM IN..." becomes a challenge for students, too, as they learn:

- Where wild horses and burros fit in the story of Western history;
- How they fit, in relation to the other components of their ecosystem;
- Why there is a need for management and protection, for fitting them in better; and
- What management alternatives to consider, through the land use decision-making process.

In short, the theme "FITTING 'EM IN..." presents an opportunity for building student *awareness*, with consideration of *relationships*, to understand the *management* process to obtain the *balance* necessary for the *survival* of wild horses and burros in their natural environment.

These areas of emphasis are described in lesson plans which may be adapted for social studies classes in upper elementary or junior high grade levels. It may be used in all parts of the United States, regardless of geographic proximity to wild horses and burros.

DEAR TEACHER:

In five lessons, you and your students will investigate an ecosystem, infer how animals fit into their habitats, and explore the relationships that exist there. More specifically, you will examine the needs of wild horses and burros, "fitting 'em in..." with other components of their own environment.

The learning package includes:

- Teacher's Guide (with pages suitable for duplication as visual aids or student handouts)
- Activity Poster
- Booklet, "Thank You for Helping Us"
- Film, "Dapples, Grays, Pintos and Bays"

Other references are provided for background information; and Bureau of Land Management personnel are a source of assistance, particularly in areas where public lands and resources can be used for field study purposes.

In the following pages, you will find lesson plans designed to stimulate your students' environmental awareness and sensitivity. With the use of visual aids and through discussion, they will be able to identify problems, reach their own conclusions, and incorporate new concepts into their value systems.

Learning Objectives. Upon successful completion of these five lesson plans, your students should be able to:

- List and discuss components of an ecosystem;
- Describe some relationships existing in an ecosystem;
- Identify and relate needs of animals to their habitat;
- Describe specific needs of wild horses within their own ecosystem;
- Verbally display interest and understanding of the need for land use decision-making to manage natural resources.

In order to present the best possible experience for your students, we encourage you to fully examine all the materials and instructions provided; and to duplicate or adapt them according to your needs.

Lesson 1 AWARENESS

Poster

A. A few days before the unit, general awareness is created through the display of the activity poster (side 1) on a bulletin board. Other materials from your own resources may be added to encourage further interest, i.e. western scenery pictures, native American artifacts, horse information, articles, etc.

Movie

B. Begin the unit with the 16-minute movie, "Dapples, Grays, Pintos and Bays".

C. Distribute student materials and "Thank You for Helping Us". Stimulate interest by inviting questions and comments from the class.

History

D. Following the movie, discuss the history of wild horses.

Suggested Activity: "A Fantasy Trip"
Instruct students to close their eyes. Using a story-telling style, take your students on an imaginary trip, tracing the history of the wild horse. Upon completion of the trip, have students open their eyes and discuss the parts of the story having the greatest impact on them. You may want to let students help tell the story, for a class effort; or even develop a mural to illustrate it.

Vocabulary

E. Involve your students with the words listed on the vocabulary pages in this guide.

Suggested Activity: "A Word Game"
Write vocabulary words relating to wild horses on separate 3x5 cards. Distribute one to each student. Begin by talking about the word on your own card. As soon as someone hears the word on his/her card, he/she begins talking. This process is repeated around the classroom. You may predetermine a time limit for the game. This type of activity introduces new words, serves as a tool for evaluating comprehension, and stimulates discussion.

Other suggestions include crossword puzzles; a "definition bee"; or "password" (after students have studied word definitions and paired off).

So far, you have helped your students become generally more aware of wild horses and burros and their origin, "fitting 'em in" to Western history. You have also exposed them to terminology concerning the natural environment.

Some Basic Facts About Wild Horses & Burros

Origin

During the last Ice Age over 10,000 years ago, horses became extinct on the North American continent. They did not reappear until horses and burros were brought to America's western plains by Spanish explorers in the 16th Century. Through the years, many escaped or were abandoned to form the first wild horse and burro herds.

Indians obtained horses from Spanish camps for hunting, fighting on horseback, and for transportation. As settlers headed West, they lost some horses which joined the wild herds. Sometimes the cavalry released horses after Army posts were closed. Still later, ranchers released horses when they could not afford to keep them.

The surefooted burros were used by early prospectors and sheepherders as pack animals because they could travel long distances and survive on desert vegetation. They too were later abandoned in favor of new forms of transportation. Others escaped to the open range.

Though today's horse and burro herds are called wild or "feral", they all come from animals that were once tame but later returned to a wild state.

Abuse

As the herds continued to multiply, the number of people in the West increased, too. The horses often were a nuisance to ranchers raising cattle and sheep. Many of the animals were killed; and commercial horse hunters began rounding them up with trucks and airplanes as their value increased as a source of pet food. Sometimes herds were driven to exhaustion and destruction, then sold to canneries.

Concern

At first, man's abuse of wild horses concerned only a few people, but the concern grew until group protests attracted national attention. Led by "Wild Horse Annie" (the late Mrs. Velma Johnston of Reno, Nevada), a major campaign began in 1950 calling for protection of wild horses and burros. The campaign also involved school children from throughout the United States, who expressed their concern to Members of Congress.

Laws

The "Wild Horse Annie Act" (Public Law 86-234) was passed on September 8, 1959, and prohibited the use of aircraft or motor vehicles to capture any wild, unbranded horse on public lands.

Twelve years later, the Wild Free-Roaming Horse and Burro Act (Public Law 92-195) was passed on December 15, 1971. The major points of this law are outlined in Lesson IV, Simulation Game.

More recently, on October 21, 1976, Congress passed the Federal Land Policy and Management Act (Public Law 94-579). One section of the Act authorized the use of helicopters for capturing wild horses and burros on public lands.

BLM & Public Lands

The Bureau of Land Management (BLM) is an agency of the U.S. Department of the Interior which is responsible for millions of acres of public lands in the western United States.

In addition to providing homes for wild horses and burros, these lands are used for grazing cattle and sheep; growing timber; wildlife habitat; mining; and outdoor recreation. Sometimes valuable minerals, like coal, oil and gas, are found under the public lands.

This western land is generally dry, with varying elevations. Extensive areas are covered with sagebrush and grasses, interrupted by steep rock walls and narrow canyons in the more rugged places.

Wild Horse Management

Along with the Forest Service (U.S. Department of Agriculture), the Bureau of Land Management is responsible for administering the laws affecting wild horses and burros. These agencies are responsible for the protection, management, and control of wild horses and burros on public lands.

In order to protect basic resources—water, soil and vegetation—and other uses of the public lands, Public Law 92-195 provided three alternative ways to control excess wild horses or burros where necessary: (1) they may be relocated to other areas inhabited by wild horses and burros on the date the Act was passed; (2) they may be placed in custody of individuals, organizations, or other government agencies; or (3) when the above methods are impractical, they may be destroyed in the most humane manner possible. All gatherings of excess animals are publicized through the news media and public meetings before roundups occur.

Future

Wild horses and burros have multiplied from an estimated 25,000 animals in 1971, when the Wild Free-Roaming Horse and Burro Act was passed, to over 63,000 animals in 1977.

As the numbers continue to grow, the tasks of managing and relocating wild horses and burros become more and more difficult.

Vocabulary

Agriculture	The science or art of farming; cultivating the soil, producing crops, and raising livestock.
Animal	Any living thing that is not a plant; capable of moving about, but not of making its own food (as plants do).
Big Game	Large, wild animals hunted for sport.
Carnivore	A flesh-eating animal.
Characteristic	A trait or feature that separates one person or thing from another.
Climate	The prevailing or average weather conditions of a place; determined by conditions of heat and cold; moisture and dryness; clearness and cloudiness; wind and calm, over a period of years.
Community	A group of plants or animals living together in the same environment.
Competition	The demand by different living things for the same food, water, places to live, and other necessities.
Component	A part of a whole; ingredient; element.
Cover	Shelter for protection; hiding place for game animals, e.g. woods, underbrush.
Decomposer	An agent, such as bacteria, which causes decay or rot.
Deterioration	Result of becoming worse; lower in value or quality.
Domestic	Tame animals; kept by man.
Ecology	The study of the interrelationships between living things and their surroundings.
Ecosystem	A system of ecological relationships, including food supply, weather and natural enemy factors, upon which the life of any particular living thing is based.
Endangered Species	Particular living things subject to danger, injury, or extinction without careful management.
Environment	All the surrounding conditions, circumstances and influences that affect the development of a living thing.
Erosion	A gradual wearing away of the earth's surface by temperature changes, running water, waves, or wind.
Excess	Too many; surplus.
Feral	Untamed; wild.
Food Chain	A group of living things so interrelated that each member feeds upon the one below it, and is in turn eaten by the organism above it.
Food Web	A group of interrelated food chains in a particular community.
Grazing	Animals feeding on growing grasses or pasture.
Habitat	The place where a plant or animal naturally lives and grows.
Harassment	The act of tormenting; disturbing by repeated attacks.

Herb	Perennial plant whose leaves or stems are used for food.
Herbivore	Animal that feeds on grass and other plants.
Heritage	Something handed down from one's ancestors or from the past.
Humane	Kind, merciful; not cruel or brutal.
Integral	Necessary for completeness; essential.
Interdependence	Dependence on one another; mutual need for existence or support.
Interrelationship	Connection; or mutual relationship.
Investigation	Careful search or examination; systematic inquiry or research.
Livestock	Animals kept for home (domestic) use or raised for sale or profit.
Management	The art or manner of handling, controlling, or directing.
Mineral	Any natural substance that is neither vegetable nor animal.
Multiple Use	Use for more than one purpose; e.g. public lands used for timber, recreation and wildlife habitat.
Natural Resources	Materials supplied by nature, e.g. minerals, water, land, forests.
Observation	Noting and recording of facts and events for study.
Organism	Any living thing; animal or plant.
Political	Having to do with citizens or government.
Population	The number of people or other organisms living in a given area.
Precipitation	Moisture in the form of rain, hail, snow, sleet.
Predator	An animal that preys upon another or others for food.
Prey	An animal that is used as food by another.
Public Lands	Lands owned and managed by the Government.
Rangeland	Land for grazing; common in the western United States.
Recreation	Play, amusement; diversion, relaxation.
Sagebrush	Grayish green shrubs common to the dry plains and mountains in the western United States.
Social	Living or associating in groups or communities.
Soil	The ground, earth; thought of as a place for growth or development.
Species	A single, distinct kind of plant or animal.
Sportsman	A person who takes part in sports, e.g. hunting, riding, racing.
Survival	The act of surviving, continuance of life; living or lasting longer than others.
Temperature	The degree of heat or cold.
Topography	Surface features of a place or area.
Topsoil	Upper part of the soil; surface soil.
Vegetation	Plant life; growing plants.
Watershed	A region drained by a river system; an area where water collects.
Wildlife	Wild animals in their natural state.

Lesson 2 MANAGEMENT

Discussion

A. From information given in the movie, booklet and student materials in Lesson I, lead a *review discussion* relating the history and management of wild horses.

Suggested Questions: Let students write them down and think about them, then discuss.

1. Let's list some things about the history of wild horses.

2. Can you identify some problems that exist concerning wild horse populations?

3. Can you think of problems wild horses might cause people and other animals in the areas where they live?

4. Describe some ways that wild horses have been treated compared to other animal populations.

5. Summarize some possible solutions to wild horse problems.

Research and Report

B. Direct students to choose a subject for individual or group reports on types of animal management. The following are suggestions:

Big game animals
Endangered species
National Park animals
Zoo animals
Domestic pets
Commercial livestock
Human animals
Predators (Coyotes, etc.)
Pests (Rats, etc.)
Wild horses and burros
City wildlife

Suggested Activity: Provide resource materials and a working period, including adequate time for library research.

So far, you have helped your students to know more about alternative methods and reasons for animal management; and to relate those methods to the needs of wild horses.

Lesson 3 RELATIONSHIPS

Reports

A. Lesson is introduced with random reports from students in response to various types of animal management assigned in Lesson 2.

Discussion

B. Stimulate discussion and make comparisons about management of any population, considering:

habitat
food and water
behavior
social needs
shelter
natural enemies
survival characteristics

Poster Exercises

C. Reverse the poster to side 2. Describe and discuss with the class the elements identified on the poster.

Suggested Activity: "The String Thing"
Have individual class members use straight pins and string to "tie" poster elements to each other; then have them explain the interrelationships that exist between them. This exercise emphasizes interdependence in the natural, as well as man-made environment.

Suggested Activity: "The Living Web"
Use pin-on signs to assign students roles, each representing an element shown on the poster. Using balls of string, they tie themselves to the other "elements" (students) with which interrelationships exist. Then, have the students explain how they are related to those they are tied to, by playing roles. This exercise dramatically displays the complexities of interrelationships in the environment of wild horses.

D. Wrap-up with "horse sense" quiz questions on poster.

So far, you have helped your students understand animal management and the complexities involved.

And you have made them aware of the specific needs of wild horses, "fitting 'em in" with human needs in their ecosystem.

Lesson 4

INVESTIGATION AND PROBLEM-SOLVING

This lesson offers two alternatives:

A. For use in areas that might have wild horse habitat—or in any other natural area—"outdoor investigations" are suggested. The lesson is divided into six steps and several activities from which to select, expand, or adapt to fit individual situations or time available.

B. The second alternative lesson plan suggested is a "simulation game", using a public meeting format, that involves land use decision-making and wild horses.

Outdoor Investigation

Suggested Activity: "Exploring Ecosystems"

It is desirable to set the stage by briefly reviewing the lesson activities to be used. For example: "During this lesson, we will observe, collect and interpret data that will help us later identify the needs and effects of wild horses within their ecosystem.'

Step A: **Observing an Ecosystem**

Students are directed to spend five to ten minutes exploring and observing the environment in an outdoor area.

After they have returned as a group, involve them in discussion with the following questions:

1. What did you observe?
2. What can we identify as specific parts of this ecosystem?
3. What characteristics exist that make it different or unique?
4. How can we describe our general impression of this ecosystem?

So far, you have helped your students improve their observation skills in the natural environment, and identify specific components of an ecosystem.

Step B: **Investigating Parts of an Ecosystem**

Class is divided into four groups. Each group investigates one of the following four elements in this ecosystem:

a. Mini-climates
b. Soils
c. Watershed
d. Vegetation.

Each group receives a lesson plan and equipment for the element assigned. Have each group spend 30 minutes investigating its assigned

element. Upon completion of investigations, they return to the large group. Teacher should float among the four groups to assist in investigations.

In order to emphasize the "community concept", involve your students with the following questions and discussion:

1. What did you find? Groups give their reports.
2. Are any of these components related to each other?
3. What would happen if one element were removed? How would system change?
4. How can we summarize our discussion of these elements in an ecosystem?

So far, you have helped your students investigate some components of an ecosystem and identify possible interrelationships.

Step C: **Observing Animals in the Area**

Have students use five to ten minutes to observe animal evidence in the study area, i.e. feathers, bones, homes, food, nests, droppings, etc.

Step D: **Investigating Animals in the Area**

Direct students to choose one animal evidence observed and spend 30 minutes on the activities described on the worksheet provided.

Follow with questions and discussion:

1. What evidence did you find?
2. What was the most common evidence found?
3. Can you tie the evidence found to the elements investigated earlier?
4. What can we say about animals as part of this ecosystem?

So far, you have helped your students explore relationships between animals and the area in which they are living.

Step E: **Exploring Relationships**

Have students use fifteen minutes to list the animals they have seen, or their evidence, and do the exercise shown on the worksheet. Follow with questions and discussion:

1. What is the role of each part in the diagram?
2. What would happen if one group was removed?
3. How do the groups relate for feeding purposes?
4. What words can you think of to describe the diagram?

So far, you have helped your students identify parts and functions of an "energy cycle" in the natural environment.

Step F:

Wild Horses as Part of the Natural Ecosystem*

Observing the present conditions and the data collected about the natural elements and animals in this area, what are some guidelines that could be suggested to insure a proper balance for those animal populations? . . .

. . . to insure a proper balance for wild horse populations?

CONSIDER: Wild horse relationships with different components of the environment, e.g. soil, water, air, plants, other animals, and man.

Have students respond to the following questions:

1. What are your guidelines?
2. What are factors and influences that contribute to wild horse management?
3. How might your guidelines affect competition among other animals?
4. Let's sum up issues influencing our guidelines.

*Adapted From: "Wild Horse Habitat Investigation", BLM Colorado State Office, Denver, Colorado

Summary:

Discussion Questions

1. What did we find out about animals in our field session today?
2. What did we find out about wild horses in our session?
3. How can we relate wild horse management to the environment?
4. How can we summarize our discussion and investigation today?

Now, you have helped your students understand the desirability of balance in the natural environment.

Step A: Observing an Ecosystem

Spend five to ten minutes exploring and observing some things in this environment. List below:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Return to large group.

Step B: Mini-Climates

Follow the directions provided. You should have thermometers, paper towels, a flask of water, clothes pins, flagging, bottle of soap bubbles, a compass.

Activity 1

Take temperature readings at the following suggested locations. Leave thermometer in place at least 2 minutes at each location. Record your findings.

1. 5 feet above the ground in an open-grassy area.
2. On the ground in an open-grassy area.
3. Resting on a rock in the open.
4. On the ground in the shade.
5. Where water might have accumulated or sunk in the ground.
6. Three inches below ground.

1. Where was the temperature highest? _____

2. Under what conditions are the greatest variety of plants found?
_____
_____
_____

3. What part do you think light and temperature play in plant growth and distribution? _____
_____
_____
_____

Activity 2

Select three different types of areas. Wet a paper towel thoroughly. Hang it with a clothes pin in each of the three areas. Measure the time it takes for the towel to dry.

1. Where did the paper dry the fastest? _____
_____

2. Why? _____
_____

3. Compare the different rates of drying or evaporation. _____
_____
_____

4. How does temperature affect evaporation? _____
_____
_____
_____
_____

Activity 3 Select a site where a breeze seems to be blowing. Blow soap bubbles, then using the compass, observe the direction and behavior of the bubbles for several minutes.

1. What do you observe that might affect the climate here?____

   Plant Life?____

   Temperature?____

2. How does slope of the land affect the plant life here?____

3. What kind of plants seem to be the strongest here?____

4. Do you think it has anything to do with the climate? Why?____

5. How does climate relate to the other elements we talked about? (Soils, watershed, plants, animals.)____

6. What can you say about the role of climate in plant distribution and vigor?____

Compile your collected data and inferences for a report to the group.

Step B: Soils

Follow the directions provided. You should have a soil thermometer, soil test kit, shovel, and a ruler.

Activity 1

Stake out an area one to three feet square on the ground and sift through the top 3 inches of soil, recording the evidence of plants and animals you observe on the chart below. The following terms describe organic matter in top soil: litter, duff, humus.

Terms & Definitions:

Litter—identifiable dead plant or animal on the surface

Duff—partially decomposed organic matter—compacted

Humus—almost completely decomposed nonidentifiable organic matter.

Describe the Feel	List the identifiable parts of plants and animals found

Discuss your findings.

1. What did you find most of?_____ Least?_____

2. Which was more 'loose'?_____
   Why?_____

3. Which was more moist?_____
   Why?_____

4. What do you think is the importance of litter, duff, and humus to soil and plants?_____

5. What can we say about soils in this area?_____

Activity 2 Insert soil thermometers in ground at following locations. Leave thermometers in place at least two minutes at each location. Record.

At base of rock _____

At base of shrub _____

In shade _____

In open grassy area _____

Near water or where water has accumulated _____

Discuss your findings

1. Where was coolest temperature? _____ Warmest? _____

   Why? _____

2. What affect do you think color of soil has on temperature? _____

3. What affect do you think temperature has on soil moisture? _____

Activity 3 Find a roadside slope, a stream bank, or dig a soil pit, then observe the different layers or horizons of soil in a bank of earth. Many soils have three layers: a. topsoils; b. subsoil; and c. parent materials. Measure and record the depth of each major layer you find. Describe the soil structure (how it is put together), texture, color and depth of root penetration.

a. _____

b. _____

c. _____

Compile your collected data for a report to the large group.

Step B: Vegetation

Follow the directions provided. You should have two 100 foot lengths of string, 4 wooden stakes, pencils, and 2 yardsticks.

Activity 1

Split into two groups. Both will inventory an area using the transect (a cross-section record) method. Choose two different areas. Stretch string along ground attaching at both ends to wooden stakes.

Record on the following table (next page) what you find at every foot along the transect.

These definitions may help you:

Litter—Identifiable plant or animal debris on ground surface.
Grasses—Plants that are annual or perennial, whether reproduced from seeds or regenerated year to year from same root base.
Forbs—Flowering plants, wild flowers and weeds.
Shrubs—Persistent woody plants, smaller than trees, with many separate stems.

Summarize your data below:

Item	Total	-100=Percentage of Total
Rock		
Bare soil		
Litter		
Grasses		
Forbs		
Shrubs		
Totals		

1. Which item had the greatest percentage coverage?_____

   The least?_____

2. Did certain plants tend to be associated with certain areas?_____

3. What reasons can you give for this?_____

4. What types of plants seem to be most abundant?_____

5. What other observations did you make about the vegetative cover here? _____

6. What do the above percentages tell us about the area? _____

7. What do they tell us about the erosion in this area? _____

Look at the plants in your area. Record your observations about them.

Plants

1. _____
2. _____
3. _____
4. _____

1. Do you observe any changes taking place? _____
2. What might be causing plant changes? _____
3. What changes do you predict will take place in the future? _____
4. How does man affect change in plants? _____
5. How do plants relate to the other elements we talked about? (Climate, soil, animals, watershed) _____

Compile your collected data and inferences for a report to the group.

Transect Table

Sample Every Foot	Rock	Bare Soil	Litter	Grasses		Forb	Shrub
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							

Sample Every Foot	Rock	Bare Soil	Litter	Grasses		Forb	Shrub
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
61							
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
Totals							

Step B: Watershed

Follow the directions provided. You should have a topographic map of the area, 4 tin cans, 2 gallons of water, a sprinkling can, 3 milk cartons filled with rocks, paper, magic marker.

Activity 1

Find your location on the topographic map. Where does water come from for this area? Trace the boundaries of the *watershed* (an area where water collects) on the map. Mark where you are on the map and look for higher elevation lines and trace back from where you are.

1. What do you notice about the slope of the land?_____

2. What is the difference in facing slopes?_____

   What accounts for this?_____

3. What can you say about how slopes affect watershed? _____

Activity 2

Soils vary in their ability to absorb water. During heavy rainstorms, soils that cannot absorb the rainwater quickly cause the water to run off. As it runs off, it picks up particles of soil and deposits them elsewhere. The soil that remains is less fertile because it is the richer top soil that has washed away.

Place a mark on each of 3 tin cans, ½ inch from the rim. Press one of the cans ½ inch deep into each of the following soils:

1. Area where grasses are abundant.
2. Bare soil.
3. Soil where sagebrush and shrubs are growing.

Use the 4th can to pour a full can of water into each of the others. Time and record the rate of absorption as soon as you start to pour, and the appearance of the soil.

1. Which area absorbed water the fastest?_____

   Slowest?_____

2. What factors seemed to contribute to the rapid absorption of water by the soil?_____

3. How does plant cover affect watershed?_____

4. How do plants use water?_____

5. Which plants do you think use the most water? (Grasses, trees, forbs, shrubs?)_____
_____

Activity 3

Before soil erosion can take place, soil particles must be loosened. Falling raindrops have considerable force. As they strike the ground surface, they break up the soil and splash small particles in the air. These particles can be easily carried away by runoff water. The amount of erosion can be measured.

Place your milk carton upright in: (1) grassy area, (2) bare soil, (3) shrub area.

Use a sprinkling can. Simulate rain by pouring water from about 3 feet above the carton.

After you "rain", compare the soil splash marks on the milk carton.

1. Which milk carton (splash pillar) had the most soil on it?_____
_____

2. What factors influence the amount of splash?_____
_____

3. What other ways besides rain can watershed be affected?_____
_____

4. What can be done to protect watershed?_____
_____

5. How does watershed relate to the other elements we talked about? (Climate, soils, plants, animals)_____
_____
_____
_____
_____

Compile your data and inferences for a report to the group.

Step C: Observing Animals

Take five to ten minutes to observe and list animals' evidence in the area.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Return to large group.

Step D: Investigating Animals

Activity 1

Working in pairs, choose one of the animals' evidence found. Recheck for more signs of the animal and see if you can identify the following habitat components the animal may have used.

1. FOOD—animal or vegetable?_____
   Grass, shrubs or forbs?_____
   Is it available for use?_____
   How good is its condition?_____
   Could other animals use it?_____
   Is there any evidence or possibility of food competition between your animal and another?_____

2. COVER—Would the animal require tall or short cover?_____
   Is cover in the form of vegetation, rocks or topography?_____
   Is there enough cover?_____
   Would the cover protect the animal from man?_____
   How "open" is the area to wind, snow, etc.?_____

3. WATER—Any visible water?_____
   Would water be in the form of streams, ponds, succulent vegetation, or what?_____
   What might the water supply look like in late summer?_____

4. LIVING SPACE—How many animals of the species you are considering do you think are present?_____
   How many different species of animals do you think are here?_____
   Would just physical room to live be limiting for your species—or between species?_____

Imagine yourself as the animal, plus other animals, in a closed room. What would you feel like? _____

_____

_____

_____

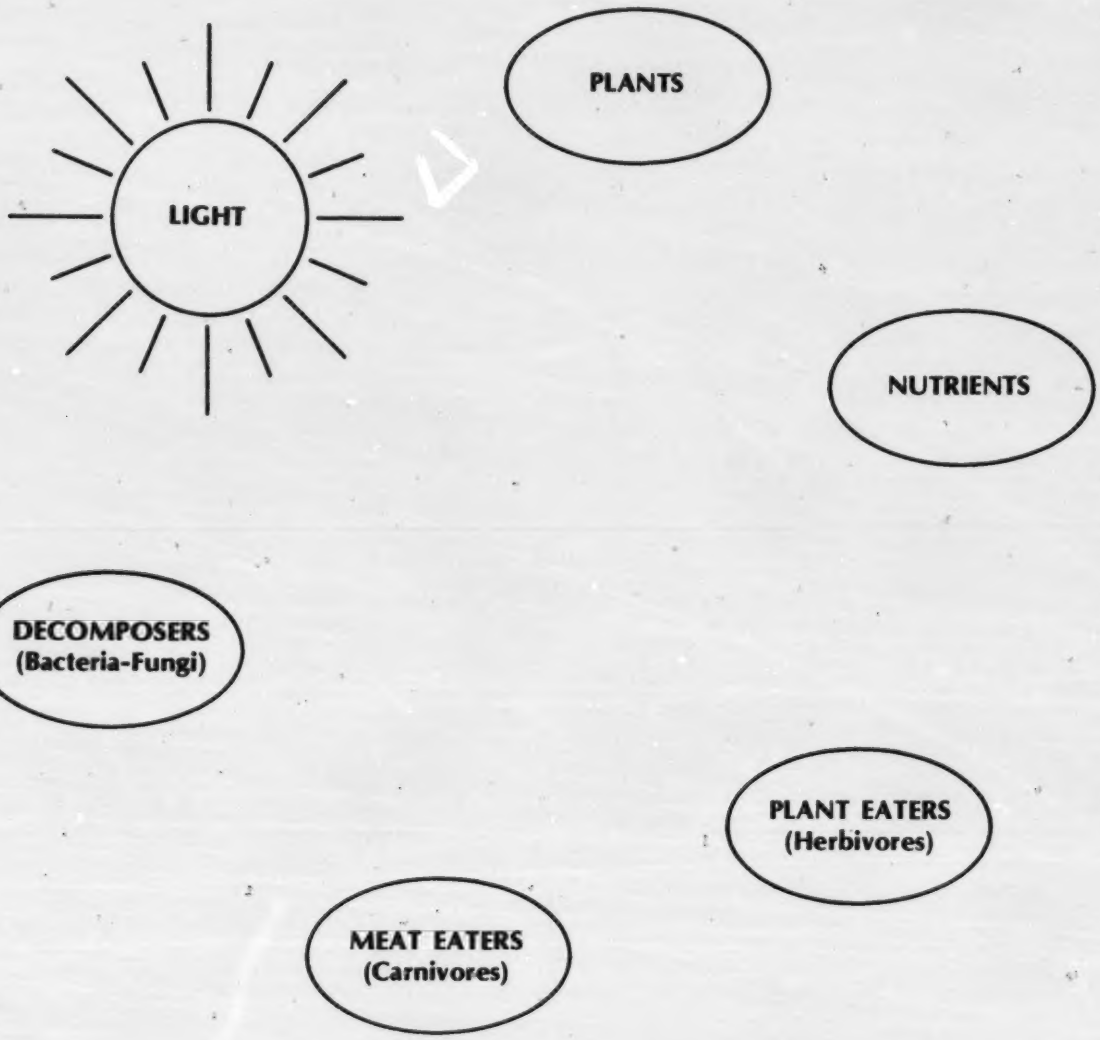
_____

Activity 2 Re-evaluate the animal you have discovered and the habitat in which it lives. How could you change it to make it better? Who do you think should effect the changes? What have you heard or what do you know about habitat improvement? What effects do animals have on plants?

Return to large group.

Step E: Exploring Relationships

In fifteen minutes, list the plants and animals you have seen—or their evidence—by the appropriate boxes in this diagram. Draw arrows to show relationships.



Adapted From: "Investigating Your Environment" Series, U.S. Forest Service, Portland, Oregon

Simulation Game

"Wild Horses on Public Lands"

Introduction

Simulation games are models of real life problems and issues. In the process, both the instructor and the students are exposed to the basic facts of an issue and allowed to assume the roles and attitudes of various interest groups or individuals. They gain the experience of examining a problem; weighing facts, alternative solutions, consequences and effects; and arriving at a decision.

Simulation games are designed to be fun, to allow free interchange of ideas, opinions and emotions regarding an issue, and to illustrate cause and effect relationships. Experience in developing positions and recommendations is provided, along with the importance of *listening* to other viewpoints.

In this case, the issue relates to America's wild horses. It is a theoretical situation, but deals with a real problem facing the American people and the Bureau of Land Management, U.S. Department of the Interior.

Even though the exercise deals with a real problem, it does not require that the instructor or students have an extensive knowledge of natural resources, environmental sciences, or ecology. Basic tools come from science, social studies, and current event subjects. Other basic information has been developed in the class reports and activities of the previous lessons.

Procedures

1. Divide the class into six groups, assigning Group #1 to choose a spokesman to serve as the BLM manager.
2. Pass out the PL 92-195 Summary and Group Data Sheets, assigning one role to each group.
3. Have the manager read the Issue Statement to the class, to open the public meeting.
4. Allow each interest group 20 minutes to develop a position and recommendation on what the BLM manager should do. Emphasize that each group must represent the values, views and attitudes of its assigned organization.
5. Allow each group five minutes to present their recommendations to the district manager, with no interruptions for questions at this time.
6. The BLM manager and staff are instructed to recess the public meeting, retiring to discuss input and arrive at a decision.
7. Have the manager announce his decision.

8. Follow up with discussion about the game, using the following questions:
   a. What are some things we discovered in this game?
   b. What did we find out specifically about the wild horses?
   c. Do people feel differently about wild horses than about other wild animal populations?
   d. Were any of the groups able to form a coalition?
   e. Were you able to develop a "feeling" for the values and attitudes of the organization you were representing? Did it help you to understand others' attitudes and beliefs on strong issues?
   f. In summary, what can we say about wild horse management?

The Issue

Public Meeting

As the Bureau of Land Management (BLM) manager for this area, I have called this public meeting for interested citizens and representatives of organizations to learn your opinions and views on a resource problem.

As an integral part of many resources—including forests, range, water, minerals, recreation and wildlife—my staff and I are responsible for a small herd of wild horses which lives on the public lands in the northern half of the district.

The herd, under Federal protection since 1971, has increased from a population of 75 to a present population of 125 animals.

The same rangeland area also has other animals, both domestic and wild, using it. A recent survey by BLM range and wildlife specialists shows that the area presently supports:

165 mule deer
25 antelope
200 cattle
1,000 sheep
2,000 upland game birds

The condition of the land and its vegetation is presently in a decline, due to an overpopulation of animals. If this is allowed to continue at its present rate, none of the animals using the area will have enough food.

The State Fish and Game Department has agreed to increase the yearly number of hunting licenses in the area.

I have determined that I have several alternatives open to me:

1. to hold a roundup of wild horses and reduce the herd to a level of 75 animals; or
2. to reduce the number of cattle and sheep grazing on the public land under a lease agreement with the ABC Cattle Company, or
3. a combination of the above; or
4. close the area to other uses, establishing an official wild horse range.

This public meeting has been called for all those having an interest and concern about the problem.

Summary
PL 92-195

Wild Free-Roaming Horse and Burro Act December 15, 1971

Major Points of the Law:

1. Protect wild free-roaming horses and burros from capture, branding, harassment or death.
2. Wild horses and burros are to be considered an integral part of the natural system of the public lands.
3. The Secretary (of Interior or Agriculture) may designate and establish specific ranges for wild horses or burros on public lands.
4. Management activities shall be at a minimal level—to protect the natural ecological balance of all wildlife species which inhabit such lands, particularly endangered species.
5. The Secretary may have excess animals removed for private maintenance under humane conditions and care. He may order old, sick or lame animals destroyed, when such action is necessary to preserve and maintain their range in suitable condition for continued use.
6. No wild horses or burros, or any part of their carcasses, can be sold directly or indirectly.
7. Wild horses or burros cannot be relocated to public lands where they were not found at the time the Act was passed.

Note: PL 86-234, known as the "Wild Horse Annie Act"; and PL 94-579, the Federal Land Policy and Management Act, also affect the management of wild horses (see Wild Horse Fact Sheet in Lesson I).

Group Data Sheet #1

BLM Manager and Staff

First, your group must choose a spokesman to serve as the BLM manager.

The manager reads the Issue Statement to the other group representatives assembled to open the public meeting.

Listen carefully when the interest groups present their views and recommendations.

After they have been presented, review the recommendations, with the assistance of the teacher.

Identify the following:

1. Similar recommendations.
2. Recommendations not within the Wild Horse & Burro Act.
3. Recommendations not within the Act, which would require Congressional action to amend the law.

After review, have the manager announce your group decision.

Group Data Sheet #2

"WHINNY"—Wild Horse & Burro Association

You are members of a nonprofit national organization of 15,000 members composed primarily of adults and students. Approximately 60 percent of the members live in the East.

Your group has an active interest in BLM's wild horse and burro management programs. You represent the local and state chapter.

"WHINNY" believes that all wild horses and burros should be protected from harassment, injury or death with strong enforcement of the Wild Free-Roaming Horse and Burro Act (PL 92-195).

You have the strong opinion that "wild horses and burros come first", and you are critical of the BLM domestic livestock grazing policy.

Group Data Sheet #3

"XYZ Coal Company"

You work for a small local company which is presently developing coal deposits on public lands in the same area where wild horses exist.

Your company is very concerned with improving its public image on environmental problems and developing good public relations with the local community.

However, the area being discussed has coal deposits important to your company's survival.

Group Data Sheet #4

"Recreation, Inc."

You represent a group of off-road vehicle users and sportsmen who have banded together to express their interests in local problems, issues and politics.

Off-road vehicle users are concerned that BLM wild horse policy will not allow them to use public lands for recreational programs.

Sportsmen are concerned about access to public lands; and deterioration of the range that may decrease wildlife and affect hunting opportunities.

Group Data Sheet #5

"Livestock Association"

Your group is a strong state organization representing cattle and sheep ranchers. ABC Cattle and Sheep Company is a member.

Your association is concerned with the BLM livestock grazing policy and the possibilities of the loss of grazing licenses.

Many members have had problems with wildlife and wild horses using the range and grazing on their adjoining private lands.

ABC Cattle Company lands are not fenced; and they are concerned about loss of grazing privileges on public lands due to increase of wild horse populations.

Group Data Sheet #6

"Green Earth Club"

Your group is a nonprofit, regional environmental organization of 5,000 members concerned with local, regional and special environmental problems.

You have a good working relationship with local and national environmental groups.

You are concerned with environmental deterioration, unplanned growth, and expansion of local communities; and destruction of ecological balances in critical areas.

"Green Earth" has both supported and opposed BLM on certain program issues.

Lesson 5 WRAP-UP/EVALUATION

A. It is suggested that the final lesson be devoted to a wrap-up discussion and/or a choice of the following:

Art

Suggested Activity: "Wild Horse Art"
Have students make a mural (or individual art work) using wild horses and/or burros as their subject. Encourage them to incorporate new ideas or facts they have learned in their illustrations.

Poems

Suggested Activity: "Cinquain"
A cinquain is a form of poetry usually having five lines, which describe how a person feels about a certain subject.

Instruct students to think about wild horses, where they live, their daily lives. Using their imagination, have them:

- Name their wild horse (or burro).
- Write two descriptive words about him.
- Write three action words about him.
- Describe the horse's relationship to his environment.
- Sum up your feelings about wild horses in one word.

Students should then read their poems to themselves; and then randomly share them with the class. They might also be displayed on the bulletin board.

Both of these suggested activities will serve as a measure for the teacher to evaluate progress from the previous lessons.

Test

B. Some teachers may wish to employ a more conventional method of testing for evaluation. Brief, objective questions might include:

1. Where do wild horses (burros) come from?
2. How many are there?
3. Which State has the most?
4. Where do they live? Describe their environment.
5. What are basic needs of wild horses (burros)?
6. What other living things are found in the same habitat with wild horses (burros)?
7. Name other uses of wild horse and burro areas. How do they relate to each other?
8. What does animal management mean? Why is it necessary?

9. Name some problems of wild horses (burros).
10. How can these problems be solved?
11. Describe how wild horses (burros) are managed.
12. What does the future hold for wild horses (burros) and public lands?

Now, you have helped your students to meet the established learning objectives of this environmental learning package, "America's Wild Horses—Fitting 'em In..."

SELECTED REFERENCES

Beebe, B. F. and J. R. Johnson. 1964. *American Wild Horses.* David McKay Company, Inc., New York. 180 p.

Brookshier, Frank. 1974. *The Burro.* University of Oklahoma Press, Norman, Oklahoma. 370 p.

Dobie, J. Frank. 1952. *The Mustangs.* Little, Brown, Boston. 376 p.

Henry, Marguerite. 1966. *Mustang, Wild Spirit of the West.* Rand McNally, Chicago. 224 p.

Laune, Paul. 1964. *Mustang Roundup.* Holt, Rinehart and Winston, New York. 154 p.

Ryden, Hope. 1970. *America's Last Wild Horses.* Dutton, New York. 311 p.

Wyman, Walker D. 1945. *The Wild Horse of the West.* Caxton Printers, Caldwell, Idaho. 348 p.

U.S. Department of the Interior, U.S. Department of Agriculture. June 1974. *A Report to Congress by the Secretary of the Interior and the Secretary of Agriculture on Administration of the Wild Free-Roaming Horse and Burro Act: P.L. 92-195.* 58 p.

U.S. Department of the Interior, U.S. Department of Agriculture. 1976. *Second Report to Congress: Administration of the Wild Free-Roaming Horse and Burro Act.* 61 p.

Zarn, Mark, Thomas Heller and Kay Collins. 1977. *Wild, Free-Roaming Horses—Status of Present Knowledge* (Technical Note 294). Bureau of Land Management, Denver. 72 p.

Zarn, Mark, Thomas Heller and Kay Collins. 1977. *Wild, Free-Roaming Horses—An Annotated Bibliography* (Technical Note 295). Bureau of Land Management, Denver. 54 p.

Zarn, Mark, Thomas Heller and Kay Collins. 1977. *Wild, Free-Roaming Burros—Status of Present Knowledge* (Technical Note 296). Bureau of Land Management, Denver. 65 p.

Zarn, Mark, Thomas Heller and Kay Collins. 1977. *Wild, Free-Roaming Burros—An Annotated Bibliography* (Technical Note 297). Bureau of Land Management, Denver. 29 p.